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(11) **EP 1 118 280 B1**

B27

(12)

EUROPEAN PATENT SPECIFICATION

(45) Date of publication and mention
of the grant of the patent:
14.04.2004 Bulletin 2004/16

(51) Int Cl.7: **A43B 7/08**

(21) Application number: **00830791.0**

(22) Date of filing: **30.11.2000**

(54) Sole structure

Sohlenaufbau

Structure de semelle

(84) Designated Contracting States:
**AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU
MC NL PT SE TR**
Designated Extension States:
AL LT LV MK RO SI

(30) Priority: **21.01.2000 IT TV200002 U**

(43) Date of publication of application:
25.07.2001 Bulletin 2001/30

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US-A- 5 375 345 US-A- 5 477 626**

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Description

[0001] The present invention relates to a sole structure able to be associated to an upper of a shoe.

[0002] Nowadays, several known shoes present on the market have multiple systems and methods for aerating the interior part of the shoe.

[0003] Some known shoes partially achieved the assigned task by means of appropriate holes, for instance obtained on the upper.

[0004] Such solutions have the considerable disadvantage of allowing water infiltration inside the shoe.

[0005] The use, in correspondence with such holes, of possible layers of materials which are transpiring and impermeable at the same time does not completely solve the problem of achieving a good aeration of the shoe, since the exchange of air between the interior of the shoe and the environment is very limited.

[0006] In other known shoes, appropriate ducts are employed, for instance obtained on the upper surface of the sole, and advantageously communicating with the exterior, so that the air can be circulated in said ducts and reach the foot passing through an appropriate transpiring arch support, in contact with said sole.

[0007] The main disadvantage of this solution also consists in the possible infiltration of water in the interior of the shoe, which takes place through the ducts.

[0008] A sole structure having the features as set forth in the preamble of claim 1 is known from US-A-5 477 626.

[0009] A further known shoe is constituted by an upper comprising a transpiring arch support, positioned superiorly to an impermeable sole.

[0010] Between said sole and the arch support is positioned an aerating device constituted by an air elastically deformable tank, through a first one-way valve, with an air diffuser element positioned in proximity to the metatarsus area and appropriately holed, in order to distribute air within the upper.

[0011] The tank is also connected to a second check valve positioned, for instance, laterally to the sole, able to draw air from the exterior.

[0012] The second check valve has a sufficiently small internal diameter to prevent water from entering, thereby guaranteeing impermeability.

[0013] This device functions while the user walks, since at each step, when the heel bears down on the ground, the tank is compressed, thereby sending air to the diffuser element.

[0014] After the foot is raised, the elastically deformable tank returns to its shape, thereby creating a vacuum that draws air from the exterior, through the second check valve.

[0015] The main drawback of this known shoe consists of the fact that it presents considerable construction complexity, having multiple delicate mechanisms in an area, the sole, that usually undergoes numerous strong stresses, with the risk that the aerating device

may be subject to malfunctions or breakage.

[0016] Another disadvantage of this shoe stems from the high global cost, essentially due to the constructive complexity of the aeration device, to the work processes to be executed and to the need to assemble the various components of the sole at the end.

[0017] The main aim of the present invention therefore is to solve the technical problems highlighted above, eliminating the drawbacks of the aforementioned prior art and thus devising an invention which allows to obtain a shoe that allows a good aspiration through the sole, whilst insuring a safe and effective impermeability.

[0018] Within the scope of the task set out above, another important aim is to obtain an invention that allows to achieve the specified aim by means of a simple and rugged aeration mechanism, thereby avoiding possible breakage or malfunctions.

[0019] Yet another important aim is to obtain an invention that achieves the specified aim without sacrificing the resistance and aesthetic quality of the shoe.

[0020] Not the least aim is to obtain an invention that is structurally simple, whilst also having low costs of production.

[0021] The aforementioned task and aims, as well as others that will become more readily apparent farther on, are achieved by a sole structure as described in the claims that follow.

[0022] Further features and advantages of the invention shall become more readily apparent from the detailed description that follows of a particular embodiment, illustrated purely by way of non limiting indication in the accompanying drawing tables, in which:

- Figure 1 shows, in an exploded view with some selected parts, a shoe comprising an upper, an arch support and a sole made in accordance with the present invention;
- Figure 2 shows a top perspective view of a gasket;
- Figure 3 shows a top perspective view of an insert;
- Figure 4 shows a top perspective view of the upper surface of the insert of Figure 3;
- Figure 5 shows a three-quarters view of the lower surface of the insert of Figure 3;
- Figure 6 shows an exploded view of the layers constituting the gasket of Figure 2;
- Figure 7 shows a lateral section view of the sole in which are positioned the insert, the gasket and the arch support;
- Figure 8 shows a plan view of the sole of Figure 7.

[0023] With reference to the aforementioned figures, the reference number 1 indicates a shoe constituted by an upper 2 where to is inferiorly associated a sole 6.

[0024] Advantageously, the sole 6 comprises superiorly an arch support 4, presenting a first and a second area, indicated with the numbers 5a and 5b, made of a transpiring material.

[0025] The sole 6 further comprises an insert 12, as

in Figures 4 and 5, and has, in the area 7 of the arch support and of the tip, first ducts 8, suitable for the circulation of air flows.

[0026] The first ducts 8 can be positioned and shaped in multiple ways; Figure 8 shows a solution providing a first pair of first ducts 8a and 8b, positioned longitudinally and slightly diverging towards the tip of the sole and transversely joined by a second pair of first ducts 8c and 8d having also the function of facilitating the deformation of the sole 6 when the user is walking, thereby easing his/her ambulation.

[0027] Also obtained in the sole 6 are one or more openings 9, in this embodiment a first, a second and a third opening, indicated respectively with the numbers 9a, 9b and 9c, obtained for instance on the first lateral surface 10 of the sole 6, in posterior and lateral position, advantageously in correspondence with the heel.

[0028] These first, second and third opening 9a, 9b and 9c can have circular, oval, elliptical or lanceolate shape, and are able to place the interior of the shoe in communication with the exterior.

[0029] In the sole 6, preferably in correspondence with the area 30 of the heel, is also obtained a seat, indicated with the number 11, having box-like shape and open superiorly, for housing the insert 12, which is shaped counter to the seat 11 itself.

[0030] In correspondence with an upper surface 13 of the insert 12, and inferiorly to the first area 5a, a central area is advantageously obtained, indicated with the number 14, elastically compressible and opportunely shaped as a spherical dome, in such a way as to project superiorly to said upper surface 13 itself.

[0031] The central area 14 is inferiorly communicating with a cavity, indicated with the number 15, obtained on the lower surface 16 of the insert 12, in such a way that to a deformation of the central area 14 corresponds a variation of the volume of the cavity 15.

[0032] On the lower surface 16 of the insert 12 are obtained second ducts 17, which depart from said cavity 15, advantageously in the radial direction.

[0033] Each second duct 17 joins the cavity 15 to the respective hole 18, external to the cavity; said holes 18 pass vertically through the insert 12 in order to place in communication the second ducts 16 with respective appropriate third ducts 19.

[0034] The third ducts 19, also suitable for air circulation inside the sole 6, are obtained on the upper surface 13 in proximity to the central area 14 and are in communication both with the first ducts 8 and with a plurality of recesses 20 in this particular embodiment with a first, a second and a third recess, indicated with the numbers 20a, 20b and 20c.

[0035] The first, second and third recesses 20a, 20b and 20c are advantageously obtained on a second lateral surface, indicated with the number 21, of said insert 12.

[0036] The first, second and third recess 20a, 20b and 20c are shaped, in a plan view, as an arc of a circle, and

are positioned respectively in correspondence with the first, second and third opening 9a, 9b and 9c.

[0037] Between the first lateral surface 10, located internally to said sole 6, and the second lateral surface 21 of the insert 12 is preferably positioned a gasket, indicated with the number 22, having approximately rectangular development and horse-shoe shape. The gasket is impermeable to water but not to air.

[0038] As shown in Figure 6, said gasket 22 is advantageously constituted by a first, a second and a third layer, indicated with the numbers 23a, 23b and 23c, heat sealed together, for instance with high frequency electromagnetic waves.

[0039] The second layer 23b is conveniently constituted by thermoplastic material and has one or more openings 24, in this embodiment a fourth, a fifth and a sixth opening, indicated with the numbers 24a, 24b and 24c, in correspondence with said first, second and third opening 9a, 9b and 9c.

[0040] The first internal layer 23a is advantageously constituted by impermeable and transpiring fabric, such as material known with the trademark GORE-TEX; the third layer 23c, appropriately holed for air passage, can be constituted, for instance, by a mesh of plastic material such as polyvinylchloride, and serves a function of support and protection against possible impacts or rubbings against external elements.

[0041] The operation of the sole 6 of the present invention therefore is as follows: with reference to Figure 7, upon laying the heel down, the user's weight causes the compression and hence the deformation of the central area 14, which consequently reduces the volume of the cavity 15.

[0042] The air contained in this cavity is thus forced to travel through the second ducts 17 and the through holes 18, in such a way as to reach the third ducts 19.

[0043] Thence, the air can circulate through the first ducts 8 or exit through the first, second and third openings 9a, 9b and 9c, passing through the first layer 23a made of GORE-TEX and the third layer 23c.

[0044] On the contrary, when the heel is raised off the ground and the weight is taken off the sole, the central area 14 returns to its non deformed configuration, causing an increase in the volume of the cavity 15.

[0045] The increase in the volume of the cavity 15 consequently causes a flow of air in the second and third ducts 17, 19 in opposite direction relative to the previous flow.

[0046] This flow of air can also come through the first ducts 8, thus aspirating the air from the interior of the shoe and through the first, the second and the third opening 9a, 9b and 9c, thus carrying external air inside the shoe.

[0047] It has thus been noted that the invention has reached its specified task and aims, a shoe having been devised that is provided with a sole that allows the exchange of air between the interior and the exterior of the shoe, thus obtaining an effective transpiration whilst

maintaining the required characteristics of impermeability and ruggedness.

[0048] Naturally, the materials employed as well as the dimensions constituting the individual components of the invention may be more pertinent according to specific requirements.

Claims

1. Sole structure able to be associated to an upper (2) of a shoe (1), presenting first ducts (8) in the area (7) of the plantar arch and of the tip and one or more lateral openings (9) in the heel area (30), whereby in said area of the heel (30) is obtained a seat (11) for a counter-shaped insert (12) provided with at least a central area (14) elastically compressible and inferiorly communicating with second ducts (17) **characterised in that** said second ducts in turn communicate with third ducts (19) obtained superiorly to said insert (12) and communicate with said first ducts (8) and with said openings (9a), (9b) and (9c) through the interposition of a gasket (22) permeable to air but not to water.
2. Structure as claimed in claim 1 **characterised in that** it comprises an arch support (4) presenting one or more areas (5a), (5b) made of transpiring material, and **in that** said first ducts (8) are constituted by a first pair (8a), (8b) of ducts positioned longitudinally and slightly diverging towards the tip of said sole and transversely joined by a second pair (8c), (8d) of first ducts.
3. Structure as claimed in claim 1 or 2 **characterised in that** said one or more openings (9) comprise a first, a second and a third opening (9a), (9b), (9c) obtained on a first lateral surface (10) of said sole (6), in correspondence with the heel area (30).
4. Structure as claimed in claim 3 **characterised in that** said first, second and third openings (9a), (9b), (9c) are obtained on said first lateral surface (10), and have circular, or oval, or elliptical or lanceolate shape, to allow communication of the interior of the shoe (1) with the exterior.
5. Structure as claimed in any other of the previous claims, **characterised in that** said seat (11) has box-like shape, open superiorly, for housing said counter-shaped insert (12).
6. Structure as claimed in any other of the previous claims, **characterised in that** said insert (12) has an upper surface (13) whereon is obtained said elastically compressible central area (14), shaped as a spherical dome and projecting superiorly from said upper surface (13) itself.
7. Structure as claimed in claim 6, **characterised in that** said central area (14) is inferiorly in communication with a cavity (15), obtained on a lower surface (16) of said insert (12), in such a way that to a deformation of said central area (14) corresponds a variation of the volume of said cavity (15).
8. Structure as claimed in claim 7, **characterised in that** said second ducts (17) depart from said cavity (15) and develop on said lower surface (16) of said insert (12), said second ducts (17) exiting radially from said cavity (15).
9. Structure as claimed in claim 8, **characterised in that** at the ends of each of said ducts (17) external to said cavity (15) is obtained a hole (18) passing vertically through said insert (12) in order to place in communication said second ducts (17) with said third ducts (15).
10. A structure as claimed in any of the claims from 6 to 9, **characterised in that** said third ducts (19) are obtained on said upper surface (13) of said insert, in proximity to said central area (14), and are in communication both with an end of said first ducts (8) and with one or more recesses (20) obtained on a second lateral surface (21) of said insert (12).
11. Structure as claimed in claims 3 and 10 **characterised in that** said insert (12) presents a first, a second and a third recess (20a), (20b), (20c) shaped, in a plan view, as an arc of a circle, each being positioned respectively in correspondence with said first, second and third opening (9a), (9b), (9c).
12. Structure as claimed in claims 3 and 10, or 11 **characterised in that** said gasket (22) positioned between said first lateral surface (10), positioned internally to said sole (6), and said second lateral surface (21) of said insert (12), said gasket (22) presenting an approximately rectangular development, in plan view, and a horse-shoe shape.
13. Structure as claimed in any other of the previous claims **characterised in that** said gasket (22) is constituted by a first, a second and a third layer (23a), (23b), (23c) heat sealed to each other, said second layer (23b) being constituted by thermoplastic material and presenting one or more openings (24).
14. Structure as claimed in claims 3 and 13 **characterised in that** said second layer (23b) presents a fourth, a fifth and a sixth opening (24a), (24b), (24c) in correspondence with said first, second and third opening (9a), (9b), (9c) obtained on said sole (6).
15. Structure as claimed in claim 13 or 14 **character-**

ised in that said first, second and third layer (23a), (23b), (23c) are heat sealed to each other by means of high frequency electromagnetic waves.

16. Structure as claimed in any of the claims from 13 to 15 characterised in that said first internal layer (23a) is constituted by both impermeable and transpiring fabric.
17. Structure as claimed in any of the claims from 13 to 16, characterised in that said third layer (23c) is holed for the passage of air, and is made of a mesh of plastic material.
18. Structure as claimed in claim 17, characterised in that said mesh of plastic material is made of polyvinylchloride.

Patentansprüche

1. Sohlenaufbau, der mit einem Oberleder (2) eines Schuhs (1) verbunden werden kann, aufweisend erste Kanäle (8) im Bereich (7) der Fusssohlenwölbung und der Spitze, und eine oder mehrere seitliche Öffnungen (9) im Fersenbereich (30), wobei in dem genannten Fersenbereich (30) ein Sitz (11) für einen gegengeformten Einsatz (12) erhalten ist, versehen mit wenigstens einem mittleren Bereich (14), elastisch komprimierbar und unten mit zweiten Kanälen (17) verbunden, **dadurch gekennzeichnet, dass** die genannten zweiten Kanäle wiederum mit dritten Kanälen (19) in Verbindung stehen, die oben in den genannten Einsatz (12) eingearbeitet sind und mit den genannten ersten Kanälen (8) und mit den genannten Öffnungen (9a), (9b) und (9c) in Verbindung stehen, und zwar durch Zwischensetzen einer luftdurchlässigen, jedoch nicht wasserdurchlässigen Dichtung (22).
2. Struktur nach Patentanspruch 1, **dadurch gekennzeichnet, dass** sie eine Fussstütze (4) enthält, welche einen oder mehrere Bereiche (5a), (5b) aus atmendem Material aufweist, und dass die genannten ersten Kanäle (8) aus einem ersten Paar (8a), (8b) von Kanälen gebildet sind, angeordnet in Längsrichtung und leicht zur Spitze der genannten Sohle hin divergierend und in Querrichtung durch ein zweites Paar (8c), (8d) von ersten Kanälen miteinander verbunden.
3. Struktur nach Patentanspruch 1 oder 2, **dadurch gekennzeichnet, dass** die genannte eine oder mehrere Öffnungen (9) eine erste, eine zweite und eine dritte Öffnung (9a), (9b), (9c) enthalten, die an einer ersten seitlichen Oberfläche (10) der genannten Sohle (6) erhalten sind, und zwar entsprechend zum Fersenbereich (30).

4. Struktur nach Patentanspruch 3, **dadurch gekennzeichnet, dass** die genannten ersten, zweiten und dritten Öffnungen (9a), (9b), (9c) an der genannten ersten seitlichen Oberfläche (10) erhalten sind und eine kreisförmige, ovale, elliptische oder lanzettenartige Form haben, um die Verbindung des Inneren des Schuhs (1) mit dem Äusseren zu erlauben.
5. Struktur nach einem beliebigen der vorstehenden Patentansprüche, **dadurch gekennzeichnet, dass** der genannte Sitz (11) eine oben offene Kastenform zur Aufnahme des genannten gegengeformten Einsatzes (12) hat.
6. Struktur nach einem beliebigen der vorstehenden Patentansprüche, **dadurch gekennzeichnet, dass** der genannte Einsatz (12) eine obere Oberfläche (13) hat, an welcher der komprimierbare mittlere Bereich (14) erhalten ist, geformt wie eine kugelförmige Haube und oben aus der genannten oberen Oberfläche (13) selbst herausragend.
7. Struktur nach Patentanspruch 6, **dadurch gekennzeichnet, dass** der genannte mittlere Bereich (14) unten mit einem Hohlraum (15) in Verbindung steht, erhalten an der unteren Oberfläche (16) des genannten Einsatzes (12), und zwar auf solche Weise, dass einer Verformung des genannten mittleren Bereiches (14) eine Veränderung des Volumens des genannten Hohlraums (15) entspricht.
8. Struktur nach Patentanspruch 7, **dadurch gekennzeichnet, dass** die genannten zweiten Kanäle (17) von dem genannten Hohlraum (15) ausgehen und sich entlang der genannten unteren Oberfläche (16) des genannten Einsatzes (12) erstrecken, wobei die genannten zweiten Kanäle (17) in radialer Richtung aus dem genannten Hohlraum (15) austreten.
9. Struktur nach Patentanspruch 8, **dadurch gekennzeichnet, dass** an den Enden eines jeden der genannten Kanäle (17) ausserhalb des genannten Hohlraums (15) ein Loch (18) eingearbeitet ist, das vertikal durch den genannten Einsatz (12) verläuft, um die genannten zweiten Kanäle (17) mit den genannten dritten Kanälen (19) in Verbindung zu bringen.
10. Struktur nach einem beliebigen der Patentansprüche von 6 bis 9, **dadurch gekennzeichnet, dass** die genannten dritten Kanäle (19) an der genannten oberen Oberfläche (13) des genannten Einsatzes (12) erhalten sind, und zwar in der Nähe des genannten mittleren Bereiches (14), und mit einem Ende der genannten ersten Kanäle (8) wie auch mit einer oder mehreren Vertiefungen (20) in Verbindung stehen, die an einer zweiten seitlichen Ober-

fläche (21) des genannten Einsatzes (12) erhalten sind.

11. Struktur nach den Patentansprüchen 3 und 10, **dadurch gekennzeichnet, dass** der genannte Einsatz (12) eine erste, eine zweite und eine dritte Vertiefung (20a), (20b), (20c) aufweist, die in Planansicht gesehen wie ein Kreisbogen ausgeführt sind, wobei jede jeweils an der entsprechenden ersten, zweiten und dritten Öffnung (9a), (9b), (9c) angeordnet ist. 5
12. Struktur nach den Patentansprüchen 3 und 10 oder 11, **dadurch gekennzeichnet, dass** die genannte, zwischen der genannten ersten seitlichen Oberfläche (10) im Inneren der genannten Sohle (6) und der genannten zweiten seitlichen Oberfläche (21) des genannten Einsatzes (12) eingesetzte Dichtung (22) in Planansicht einen ungefähr rechteckigen Verlauf hat und eine Hufeisenform aufweist. 10
13. Struktur nach einem beliebigen der vorstehenden Patentansprüche, **dadurch gekennzeichnet, dass** die genannte Dichtung (22) aus einer ersten, einer zweiten und einer dritten Lage (23a), (23b), (23c) gebildet ist, welche miteinander heissversiegelt sind, wobei die genannte zweite Lage (23b) aus einem thermoplastischen Material hergestellt ist und eine oder mehrere Öffnungen (24) aufweist. 15
14. Struktur nach den Patentansprüchen 3 und 13, **dadurch gekennzeichnet, dass** die genannte zweite Lage (23b) eine vierte, eine fünfte und eine sechste Öffnung (24a), (24b), (24c) aufweist, und zwar entsprechend den genannten ersten, zweiten und dritten Öffnungen (9a), (9b), (9c), erhalten an der genannten Sohle (6). 20
15. Struktur nach dem Patentanspruch 13 oder 14, **dadurch gekennzeichnet, dass** die genannten ersten, zweiten und dritten Lagen (23a), (23b), (23c) mit Hilfe von elektromagnetischen Wellen mit hoher Frequenz erzeugenden Mitteln heissversiegelt sind. 25
16. Struktur nach einem beliebigen der Patentansprüche von 13 bis 15, **dadurch gekennzeichnet, dass** die genannte erste interne Lage (23a) aus einem undurchlässigen wie auch atmenden Gewebe hergestellt ist. 30
17. Struktur nach einem beliebigen der Patentansprüche von 13 bis 16, **dadurch gekennzeichnet, dass** die genannte dritte Lage (23c) für den Luftdurchlass gelocht und aus einer Netzstruktur aus Kunststoffmaterial hergestellt ist. 35
18. Struktur nach Patentanspruch 17, **dadurch ge-** 40

kennzeichnet, dass die genannte Netzstruktur aus Kunststoffmaterial aus Polyvinylchlorid hergestellt ist.

Revendications

1. Structure de semelle pouvant être associée à la partie supérieure (2) d'une chaussure (1), présentant des premiers conduits (8) dans la partie (7) de la voûte plantaire et de la pointe et une ou plusieurs ouvertures (9) latérales dans la partie du talon (30), par laquelle dans ladite partie du talon (30) un logement (11) est obtenu pour une insertion (12) contre-formée dotée d'au moins une zone centrale (14) à compression élastique et communiquant inférieurement avec des seconds conduits (17) **caractérisé en ce que** lesdits seconds conduits communiquent à leur tour avec les troisièmes conduits (19) situés en dessus de ladite insertion (12) et qui communiquent avec lesdits premiers conduits (8) et avec lesdites ouvertures (9a), (9b) et (9c) par le biais de l'interposition d'une garniture (22) perméable à l'air mais pas à l'eau.
2. Structure selon la revendication 1 **caractérisée en ce qu'elle** inclut un support (4) de voûte plantaire présentant une ou plusieurs parties (5a), (5b) constituée de matériau transpirant, et **en ce que** lesdits premiers conduits (8) sont constitués d'une première paire (8a), (8b) de conduits positionnés longitudinalement et légèrement divergents vers la pointe de ladite semelle et associés transversalement par une seconde paire (8c), (8d) de premiers conduits.
3. Structure selon les revendications 1 ou 2, **caractérisée en ce qu'une** ou plusieurs ouvertures (9) comprennent une première, une seconde et une troisième ouverture (9a), (9b), (9c) obtenues sur une première surface (10) latérale de ladite semelle (6), au niveau de la zone du talon (30).
4. Structure selon la revendication 3, **caractérisée en ce que** lesdites premières, secondes et troisièmes ouvertures (9a), (9b), (9c) sont obtenues sur ladite première surface (10) latérale, et elles ont une forme circulaire, ovale, elliptique ou lancéolée pour permettre une communication entre l'intérieur de la chaussure (1) et l'extérieur.
5. Structure selon n'importe laquelle des revendications précédentes, **caractérisée en ce que** ledit logement (11) est en forme de boîte, ouvert en dessus, pour loger ladite insertion (12) contre-formée.
6. Structure selon n'importe laquelle des revendications précédentes, **caractérisée en ce que** ladite insertion (12) a une surface (13) supérieure sur la-

quelle s'obtient ladite zone (14) centrale, compressible de façon élastique, en forme de dôme sphérique et se développant supérieurement à partir de ladite surface supérieure (13).

7. Structure selon la revendication 6, **caractérisée en ce que** ladite zone (14) centrale communique inférieurement avec une cavité (15), située sur une surface inférieure (16) de ladite insertion (12), de telle façon qu'à une déformation de ladite zone (14) centrale corresponde une variation du volume de ladite cavité (15).

8. Structure selon la revendication 7, **caractérisée en ce que** les seconds conduits (17) partent de ladite cavité (15) et se développent sur ladite surface inférieure (16) de ladite insertion (12), lesdits seconds conduits (17) débouchant de façon radiale de ladite cavité (15).

9. Structure selon la revendication 8, **caractérisée en ce qu'à** l'extrémité de chacun desdits conduits (17) externes à ladite cavité (15) se trouve un orifice (18) passant verticalement à travers ladite insertion (12) de façon à mettre en communication lesdits seconds conduits (17) et lesdits troisièmes conduits (15).

10. Structure selon les revendications de 6 à 9, **caractérisée en ce que** lesdits troisièmes conduits (19) sont situés sur ladite surface (13) supérieure de ladite insertion, à proximité de ladite zone (14) centrale, et communiquent tous les deux avec une extrémité desdits premiers conduits (8) et avec un ou plusieurs recoins (20) situés sur une seconde surface (21) latérale de ladite insertion (12).

11. Structure selon les revendications de 3 et 10, **caractérisées en ce que** ladite insertion (12) présente un premier, un second et un troisième recoin (20a), (20b), (20c) ayant la forme, vue en plan, d'un arc de cercle, chacun étant positionné respectivement au niveau de la première, seconde et troisième ouverture (9a), (9b), (9c).

12. Structure selon les revendications 3 et 10, ou 11, **caractérisée en ce que** ladite garniture (22) positionnée entre ladite première surface (10) latérale, positionnée à l'intérieur de ladite semelle (6), et ladite seconde surface (21) latérale de ladite insertion (12), ladite garniture (22) présentant un développement approximativement rectangulaire, vu en plan, et une forme en fer à cheval.

13. Structure selon n'importe laquelle des revendications précédentes, **caractérisée en ce que** ladite garniture (22) est constituée d'une première, d'une seconde et d'une troisième couche (23a), (23b),

(23c) scellée à chaud l'une à l'autre, ladite seconde couche (23b) étant constituée d'un matériau thermoplastique et présentant un ou plusieurs orifices (24).

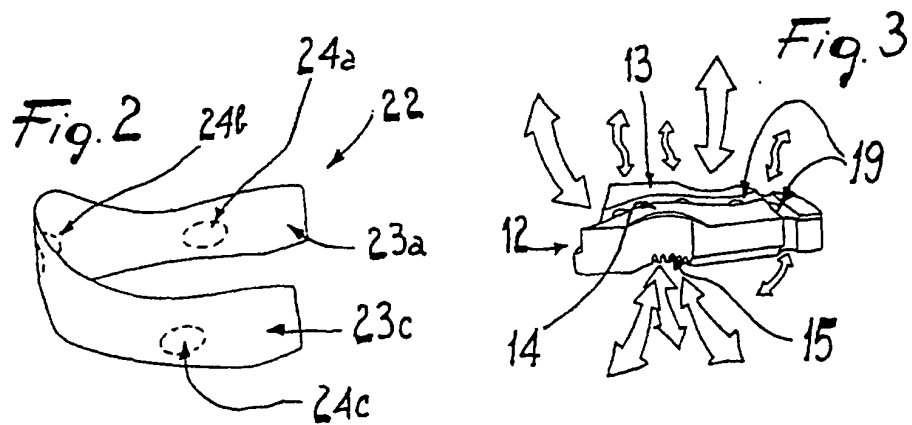
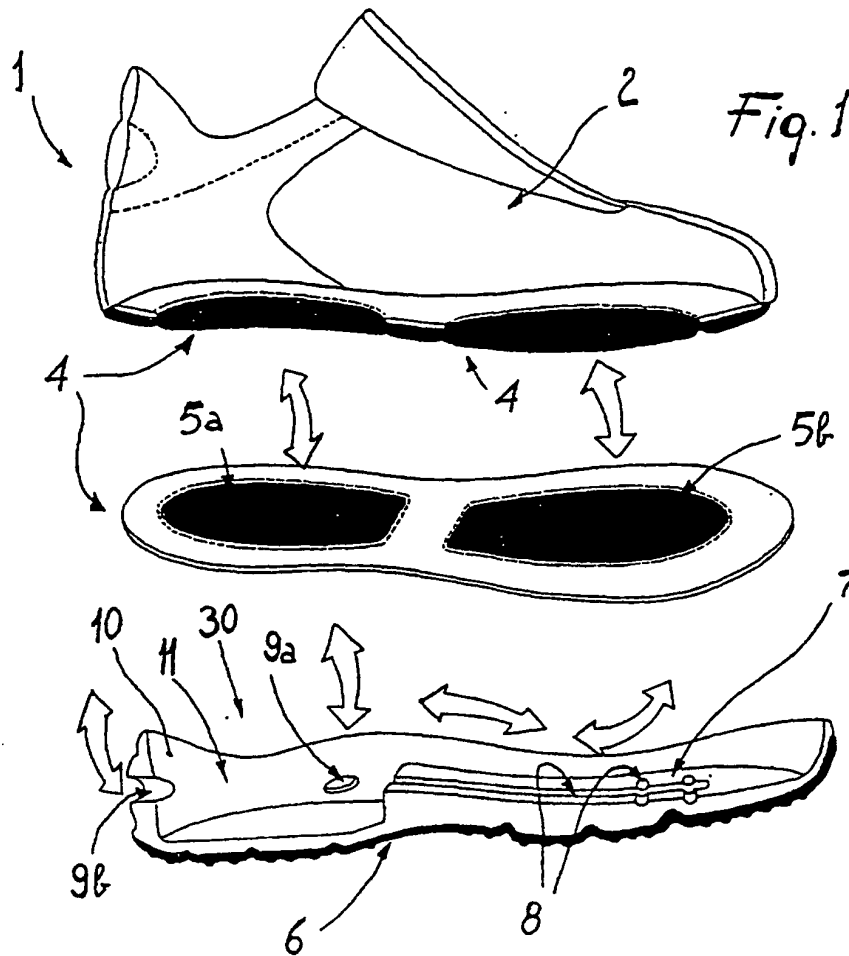
14. Structure selon les revendications 3 et 13, **caractérisée en ce que** ladite seconde couche (23b) présente un quatrième, un cinquième et un sixième orifice (24a), (24b), (24c) au niveau desdits premier, second et troisième orifices (9a), (9b), (9c) situés sur ladite semelle (6).

15. Structure selon les revendications 13 ou 14, **caractérisée en ce que** lesdites première, seconde et troisième couches (23a), (23b), (23c) sont scellées à chaud l'une à l'autre au moyen d'ondes électromagnétiques à haute fréquence.

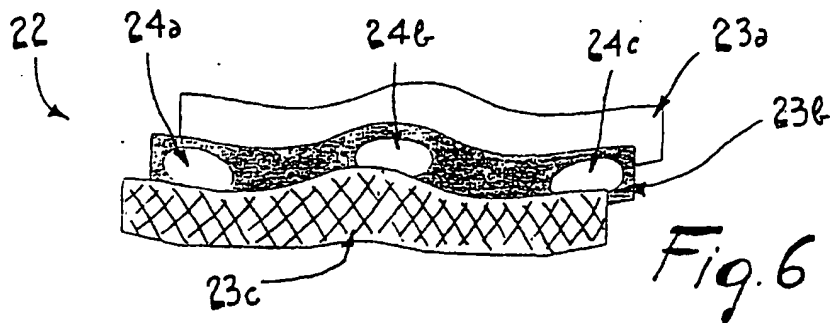
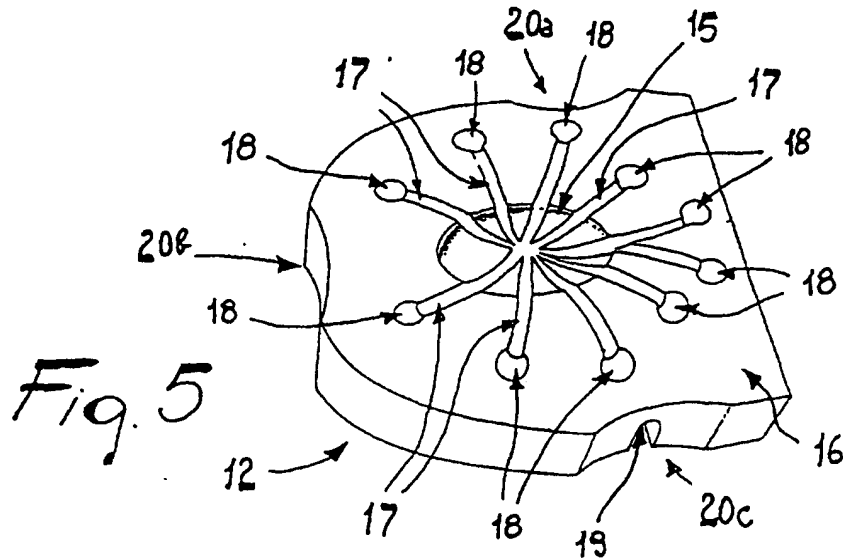
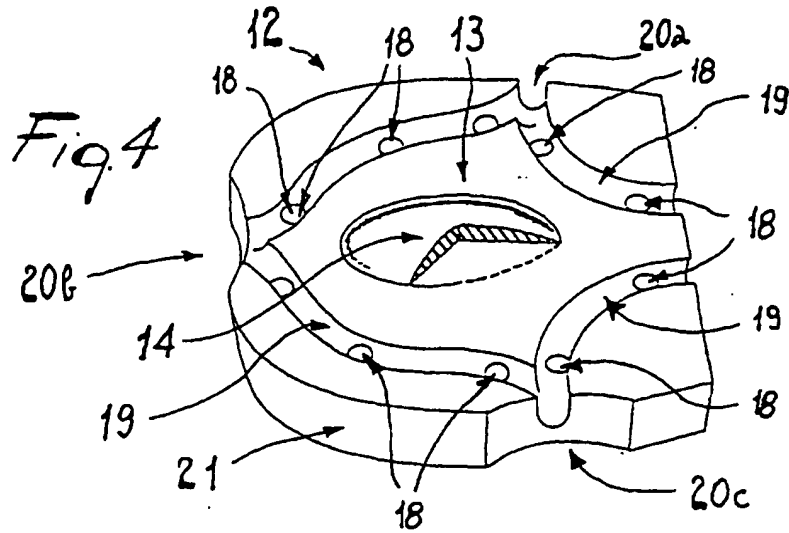
16. Structure selon n'importe laquelle des revendications de 13 à 15, **caractérisée en ce que** ladite première couche (23a) interne est faite d'un tissu à la fois imperméable et transpirant.

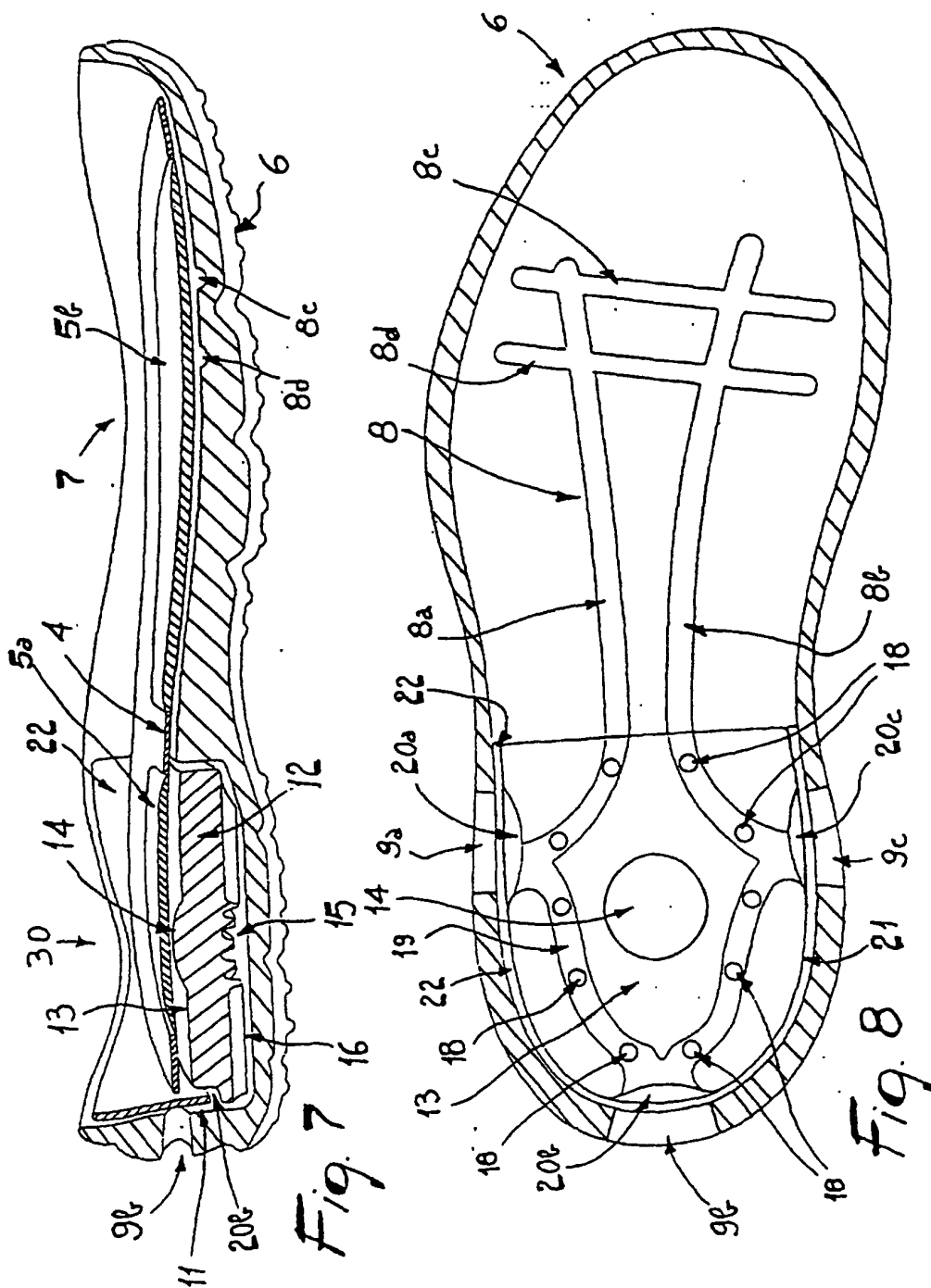
17. Structure selon n'importe laquelle des revendications de 13 à 16, **caractérisée en ce que** ladite troisième couche (23c) est percée de petits trous pour permettre le passage de l'air et est faite d'un tissu à mailles en plastique.

18. Structure selon la revendication 17, **caractérisée en ce que** le tissu à mailles en plastique est en polychlorure de vinyle.



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